

Anne 1: List of chemicals of international concern

Persistent Organic Pollutants (POPs):

POPs are a group of compounds that remain intact in the environment for long periods, become widely distributed in nature and accumulate in the fatty tissue of humans and wildlife. Exposure to POPs can lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and even diminished intelligence. The first 12 POPs under the Stockholm Convention were aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, polychlorinated biphenyls (PCBs), DDT, PCDD (dioxins) and PCDF (furans). In May 2009, nine new chemicals were added: alpha, beta and gamma hexachlorocyclohexane, chlordecone, commercial penta- and octa- brominated diphenyl ethers, pentachlorobenzene, hexabromobiphenyl and perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride.

DDT

DDT (1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane) is a pesticide that was widely used in agriculture and public health. DDT is often used to refer to related compounds DDE (1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene) and DDD (1,1-dichloro-2,2-bis(p-chlorophenyl)ethane). DDE and DDD are present as contaminants in technical grade DDT and are also breakdown products of DDT. The Stockholm Convention allows the use of DDT for use in public health for disease vector control as recommended by and under the guidance of the World Health Organization (WHO). The WHO recommends the use of DDT for indoor residue spraying only to control, in particular, the anopheles mosquito that carries the malaria parasite.

DDT and related compounds are very persistent in the environment. Half of them can be found in the soil 10-15 years after application. They are also transported large distances and have been found in the Arctic and Antarctic environment where they have never been used. DDT accumulates acutely in fish and marine mammals (such as seals and whales), reaching levels many thousands of times higher than in the surrounding water. DDT and its metabolites have been detected in food from all over the world. For most people, food is the greatest source of exposure.

DDT is not very toxic to humans. However, its persistence and accumulation has given rise to concern in relation to possible long-term impacts. While a wide range of effects have been reported in laboratory animals, these have not been confirmed in human studies. There is some evidence that DDT may disrupt reproductive and endocrine functions, and studies in animals have shown that oral exposure to DDT can cause liver cancer. The World Health Organization is currently undertaking an updated human health risk assessment of DDT, to be finalized in 2010.

Lindane

Lindane has been used as a broad-spectrum insecticide for seed and soil treatment, leaf applications, in tree and wood treatment and against external parasites such as ticks and fleas in both veterinary and human medicine. The manufacture of lindane results in the production of by-products of two related

IARC has determined that PCBs are probably carcinogenic to humans. A few studies of exposed workers have indicated that PCBs are associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats fed food containing high levels of PCB for two years developed liver cancer.⁴²

PFOS

Perfluorooctane sulfonate (PFOS) is commonly used as a salt in some applications or incorporated into larger polymers. PFOS can be formed by degradation from a large group of substances, referred to as PFOS-related.

PFOS-related chemicals are used in a variety of products, including as surface-treatments of fabric for soil/stain resistance, as part of a sizing agent formulation in coating of paper and in specialised applications such as fire fighting foams. They can be released to the environment during their manufacture, during their use in industrial and consumer applications, and from disposal of the chemicals or of products or articles containing them after their use.

PFOS is persistent in the environment and has been shown to bioconcentrate in fish. The only known condition whereby PFOS is degraded is through high temperature incineration. PFOS also travels large distances in the environment and is found in the Arctic biota far from its sources.

PFOS is toxic to mammalian species. Repeated exposure damages the liver and increases mortality; newborns may be more sensitive to these effects. Studies of exposed workers have shown an association between PFOS and the incidence of bladder cancer; an experimental study in animals has shown that exposure to PFOS results in liver and thyroid tumours. PFOS appears to be of low toxicity to fish but more toxic to other aquatic organisms. There is evidence of high acute toxicity to honey bees.⁴³

Polybrominated Flame Retardants

Polybrominated diphenyl ethers have had a wide range of uses, including in polyurethane foams and plastics for electronic equipment. They are a class of substances used as flame retardants that are physically combined with the material being treated. This means that they retain their chemical structure in the product. The physical, chemical and toxicological properties of the compounds vary depending on the form and bromination level of the specific substance.

Brominated diphenyl ethers are of concern because they are persistent, bioaccumulate and are transported long distances in the environment. Monitoring data in remote areas shows evidence of the long transport range of these compounds. The degradation of brominated diphenyl ethers in the environment and biota is a key issue as compounds with higher number of bromine atoms are converted to forms with less bromine that are possibly more toxic. Some brominated diphenyl ethers have been measured in wildlife at levels that are similar to those where adverse effects have been noted in experimental animals.

⁴² Source: Guidelines on BAT and Guidance on BEP December 2006

⁴³ Source: Perfluorooctane Sulfonate Risk Profile. Adopted by the POPs Review Committee, Stockholm Convention on Persistent Organic Pollutants, November 2006; Hazard Assessment of Perfluorooctane Sulfonate (PFOS) and its Salts, Organisation for Economic Co-operation and Development, Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, Paris, November 21, 2002.

There is incomplete understanding of the toxicology of brominated diphenyl ethers, either individually or as a mixture. Specific studies have reported hazards such as delayed neurotoxicity, immunotoxicity, reproductive toxicity, neurodevelopmental toxicity and effects on the thyroid hormones. It is also possible that polybrominated diphenyl ethers are endocrine disruptors. Pregnant women, embryos and infants are more vulnerable because of effects on the thyroid hormone balance and the development of the embryo's central nervous system.

The phase-out of polybrominated flame retardants has reduced their release in the environment and levels measured in people in Europe. However, there is still a large stock of materials in use, such as polyurethane foams and plastics in electronic equipment. Polybrominated flame retardants continue

Mercury

Mercury has been used in various products and processes for hundreds of years. Industrial processes, coal-fired power plants, mining and waste sites are important sources of mercury into the environment.

Highly Hazardous Pesticides

While further regulation in advanced industrialised countries increasingly excludes highly hazardous pesticides, their intensive use remains common in many developing countries. In many areas there is considerable overuse and abuse of such products, resulting in relatively high incidence of farmer poisoning and pesticide residues on food crops, particularly fruit and vegetables, above established Maximum Residue Levels. The Forum VI of the Intergovernmental Forum on Chemical Safety (IFCS) recognised and recommended that promotion of integrated pest management, which reduces reliance on pesticides, should be a key element of risk reduction strategies for pesticides.

Annex 3: Overview of main international chemical-related agreements

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Strategic approach to international chemicals management (SAICM)⁵⁰

Adopted by the International Conference on Chemicals Management (ICCM) on 6 February 2006 in Dubai, United Arab Emirates, the Strategic Approach to International Chemicals Management (SAICM) is an international voluntary policy framework to foster the sound management of chemicals. Its aim is to support the achievement of the goal agreed at the 2002 Johannesburg World Summit on Sustainable Development of ensuring that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health. A major driving force for the establishment of the Strategic Approach has been the recognition of the growing gaps between the capacities of different countries to manage chemicals safely, the need to improve synergies between existing instruments and processes and the growing sense of urgency regarding the need to assess and manage chemicals more effectively to achieve the 2020 goal articulated in the Johannesburg Plan of Implementation.

Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer

The 1985 Vienna Convention, its 1987 Montreal Protocol and subsequent amendments are aimed at protecting the ozone layer from various human activities. The Convention encourages intergovernmental cooperation on research, systematic observations of the ozone layer, monitoring CFC production and the exchange of relevant information on human activities. The Convention is concerned with the indirect effect of chemical substances on the ozone layer. When CFCs breakdown, they release chlorine atoms which give rise to ozone depletion. Similarly, bromine atoms are released by halon breakdowns that have a similar impact. The Vienna Convention is a framework Convention and does not contain legally binding controls or targets. The Montreal Protocol was designed to reduce the production and consumption of a number of CFCs and several halons following agreed phase-out schedules that are based on scientific and technical assessments. Amendments to the Protocol have adjusted the phase-out schedules, introduced new controlled substances to the list and introduced other types of control measures. A range of alternative chemical substances have been developed and commercialized allowing developed countries to end the use of CFCs faster than originally anticipated. The Montreal Amendment to the Protocol included provision to ban exports of used, recycled and reclaimed substances other than for destruction, to discourage illegal sales of these substances.⁵¹

International Code of Conduct on the Distribution and Use of Pesticides (Revised version)

The 2002 version of the FAO International Code is a revised version of the 1985 Code of the same name. Provisions for PIC originally drafted in the earlier Code were removed from the revised version, as the Rotterdam Convention specifically addressed this important issue. The Code was developed in response to a growing concern regarding the appropriateness of supplying pesticides to countries that lack the infrastructure to register pesticides and thereby ensure their safe use. The objectives of the

⁵⁰ SAICM website: www.saicm.org

⁵¹ Developing and Sustaining an Integrated National Programme for Sound Chemicals Management; UNITAR, 2004.

Code are to establish voluntary standards of conduct for all public and private entities engaged in, or associated with the trade, distribution and use of pesticides, particularly where there is inadequate or no national legislation to regulate pesticides. The standards set forth in the Code focus on risk reduction, protection of human health and the environment, and support for sustainable agriculture developed by adopting various procedures. The Code details responsibilities of governments to legislate, regulate and enforce such actions as well as establish information exchange networks between regulatory authorities on actions for banned or severely restricted pesticides. Establishment of appropriate educational, advisory, extension and health care services are also included. Under the Code, industry is responsible for adhering to standards of manufacture, distribution and advertising of pesticides especially in countries that lack appropriate legislation or means of implementing regulations. They also have to ensure that pesticides are adequately tested in terms of risk and that pesticides are adequately labelled and packaged. ⁵¹

ILO Chemicals Convention 1990, No. 170

The Convention represents one of the most far-reaching international agreements in the area of chemi-

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